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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/573,544

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EXAMINER

RODELA, EDUARDO A

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/573,544	Applicant(s) FRENZEL ET AL.	
	Examiner EDUARDO A. RODELA	Art Unit 2893	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/27/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the preliminary amendment received April 9, 2007. Claims 1-12 have been cancelled, claims 13-27 are now under consideration.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 13-18, 20-23 and 25-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Losehand et al. (US 2004/0095502).

Regarding Claim 13, Losehand shows in Figure 1 and separately in Figure 2, an optical module, comprising:

a circuit carrier [11];

a semiconductor element [4/9] disposed on said circuit carrier [4/9 on 11], said semiconductor element [4/9] having an optically sensitive surface [10, paragraph 0057, "light sensitive sensor 4"]; and

a lens unit [2,35] for projecting electromagnetic radiation onto said semiconductor element [4/9];

said lens unit [2,35] being supported directly [lower surface of 35 contacting 4/9 at 10] on said sensitive surface [10] of said semiconductor element [4/9].

Regarding Claim 14, Losehand shows in Figures 1 and 2, the optical module according to claim 13, wherein said lens unit [2,35] includes a lens holder [3] supported [at left and right edges of 4/9] on said sensitive surface [10] of said semiconductor element [4/9].

Regarding Claim 15, Losehand shows in Figures 1, 2 and 4, the optical module according to claim 13, which further comprises a frame-shaped area ["aperture" - 14] formed on said lens holder [3], wherein said semiconductor element [4/9] rests on [4/9 "rests on" 3, exactly as how the applicant's orientation is in Figure 1, Losehand's figure is just flipped] said frame-shaped area ["aperture" - 14] with said optically sensitive surface [10].

Regarding Claim 16, Losehand shows in Figures 1, 2 and 4, the optical module according to claim 13, which further comprises a frame-type support [region of 3 making contact with 4/9, and also defining the aperture for incoming light] formed on said lens holder [previously discussed portion integrally formed on 3, which is how the applicant's "frame" portion 32 is formed as integral to the "lens holder" 14 in Figure 2 of the drawings], wherein said semiconductor element [4/9] rests on said support [region of 3 making contact with 4/9] with said optically sensitive surface [10].

Regarding Claim 17, Losehand shows in Figures 1, 2 and 4, the optical module according to claim 13, wherein said lens unit [2,35] includes a support lens [portion 35 of 2,35] disposed on said-sensitive surface [10] of said semiconductor element [4/9].

Regarding Claim 18, Losehand shows in Figures 1, 2 and 4, the optical module according to claim 17, wherein said support lens [portion 35 of 2,35] is formed with a flat surface [shown] resting on said sensitive surface [10] of said semiconductor element [4/9].

Regarding Claim 20, Losehand shows in Figures 1, 2 and 4, the optical module according to claim 17, which further comprises a frame-type support [region of 3 making contact with 4/9, and also defining the aperture for incoming light] formed on said support lens [previously discussed portion integrally formed on 3, which is how the applicant's "frame" portion 32 is formed as integral to the "lens holder" 14 in Figure 2 of the drawings] at least in sections thereof [at periphery of 4/9], and wherein said sensitive area [10] of said semiconductor element [4/9] rests on said support [region of 3 making contact with 4/9].

Regarding Claim 21, Losehand shows in Figure 1, the optical module according to claim 13, wherein:

said lens unit [2, 35] is disposed on one side of said circuit carrier [11] and said semiconductor element [4/9] is disposed on an opposite side thereof; and said circuit carrier [11] is formed with an opening [area where not covering portion 10 of 4/9] allowing electromagnetic radiation to be projected by a lens [2,35] assembly of said lens unit [2,35] onto said semiconductor element [4/9].

Regarding Claim 22, Losehand shows in Figures 1, 2 and 4, the optical module according to claim 20, wherein said frame-type support [region of 3 making contact with 4/9, and also defining the aperture for incoming light] formed on said support lens

[previously discussed portion integrally formed on 3, which is how the applicant's "frame" portion 32 is formed as integral to the "lens holder" 14 in Figure 2 of the drawings] of said support lens is:

at least as large as said sensitive surface [surrounds periphery of 10, therefore it is at least as large as 10 in terms of width] of said semiconductor element [4/9];

and slightly smaller [portion of 3 in contact with 10 allows for an opening] than an opening formed in said circuit carrier [where 11 does not cover 10] through which electromagnetic radiation is projected onto said semiconductor element [10].

Regarding Claim 23, Losehand shows in Figures 1, 2 and 4, the optical module according to claim 15, wherein said frame-shaped area of said lens holder [region of 3 making contact with 4/9, and also defining the aperture for incoming light] is:

at least as large [region of 3 making contact with 4/9 spans width of light receiving portion] as said sensitive surface [10] of said semiconductor element [4/9];

and slightly smaller [doesn't cover light receiving area of 10] than an opening formed in said circuit carrier [where 11 doesn't cover 10] through which electromagnetic radiation is projected onto said semiconductor element [4/9].

Regarding Claim 25, Losehand shows in Figure 1, the optical module according to claim 16, wherein said lens holder [3] is connected to said circuit carrier [11] away from an opening [the opening is the portion of the surface 10 of the chip not covered by 11] formed in said circuit carrier [discontinuity in 11].

Regarding Claim 26, Losehand shows in Figure 1, the optical module according to claim 25, wherein said lens holder [3] is connected to said circuit carrier [11] by gluing [self adhered since molded material].

It is noted that the limitations of the lens holder being “connected to said circuit carrier by gluing, laser-welding, and/or screwing” are considered to be process limitations that carry no patentable weight because the current claim is directed to a device structure, therefore a “product by process” claim is directed to the product, and no matter how the structure is actually made, it is the final product which must be determined in a “product by process” claim, and not the patentability of the process. The presence of process limitations on product claims, which product does not otherwise patentably distinguish over prior art, cannot impart

Regarding Claim 27, Losehand shows in Figures 1, 2 and 4, the optical system, comprising an optical module according to claim 13 [see rejection of claim 13 above].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Losehand et al. (US 2004/0095502) in view of Suenaga (US 6,924,514).

Regarding Claim 19, Losehand shows in Figure 2, the optical module according to claim 18. Losehand shows in Figure 2 which comprises an amount of optical material

[22 not at 35] between the flat surface [lower surface portion of 35] of said support lens [portion 35 of 2,35] and said sensitive surface [10] of said semiconductor element [4/9].

Losehand does not show wherein the optical material is composed of optical gel in particular.

Suenaga shows wherein an optical adhesive material is made of optical gel [in paragraph with heading 'EXAMPLE 7'].

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used optical gel as for the particular type of optical material in the invention of Losehand as taught by Suenaga, for the purpose of providing a pliant and protective layer which will not harm the sensitive light receiving surface of the light sensing device.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Losehand et al. (US 2004/0095502) in view of in view of Honda et al. (US 6,476,417).

Regarding Claim 24, Losehand shows in Figure 2, the optical module according to claim 16, wherein:

said semiconductor element is flip-chip [in Fig. 2, 4/9 on 11] mounted on said circuit carrier [11].

Losehand does not show wherein said lens holder is formed as a closed frame formed to function as a flow barrier against an underfill material introduced between said semiconductor element and said circuit carrier during a mounting operation of said semiconductor element on said circuit carrier.

Honda shows in Figure 7 (which is a close up view of Figure 1A), wherein said lens holder [16A/64] is formed as a closed frame [portion 64 meets surface of chip 12a] formed to function as a flow barrier [will not allow any material to light sensitive surface area of chip 12A] against an underfill material [20] introduced between said semiconductor element [12] and said circuit carrier [14] during a mounting operation of said semiconductor element [12] on said circuit carrier [14].

Honda teaches that this feature is useful in several ways including to prevent light from entering unintentionally from the sides of the mounting structure.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the said lens holder is formed as a closed frame formed to function as a flow barrier against an underfill material introduced between said semiconductor element and said circuit carrier during a mounting operation of said semiconductor element on said circuit carrier in the invention of Losehand as taught by Honda, for the purpose of preventing light from entering at the sides unintentionally.

It is noted that the limitations of the lens holder being “formed...during a mounting operation of said semiconductor element on said circuit carrier” is considered to be a process limitation that carries no patentable weight because the current claim is directed to a device structure, therefore a “product by process” claim is directed to the product, and no matter how the structure is actually made, it is the final product which must be determined in a “product by process” claim, and not the patentability of the process. The presence of process limitations on product claims, which product does

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not otherwise patentably distinguish over prior art, cannot impart patentability to the product. *In re Stephens* 145 USPQ 656 (CCPA 1965).

Fax / Telephone Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDUARDO A. RODELA whose telephone number is (571)272-8797. The examiner can normally be reached on M-F, 9:00AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Davienne Monbleau can be reached on (571) 272-1945. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Davienne Monbleau/
Supervisory Patent Examiner, Art Unit 2893

EDUARDO A RODELA /EAR/
Examiner
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